Computer Hardware and Input Hardware

Lecture 4

Computer Hardware

The physical components of a computer which can be touched, called Computer Hardware.

By itself, a computer has no intelligence and is referred to as hardware. A computer can’t be used until it is connected to other parts of a computer system.

Computer Systems Hardware

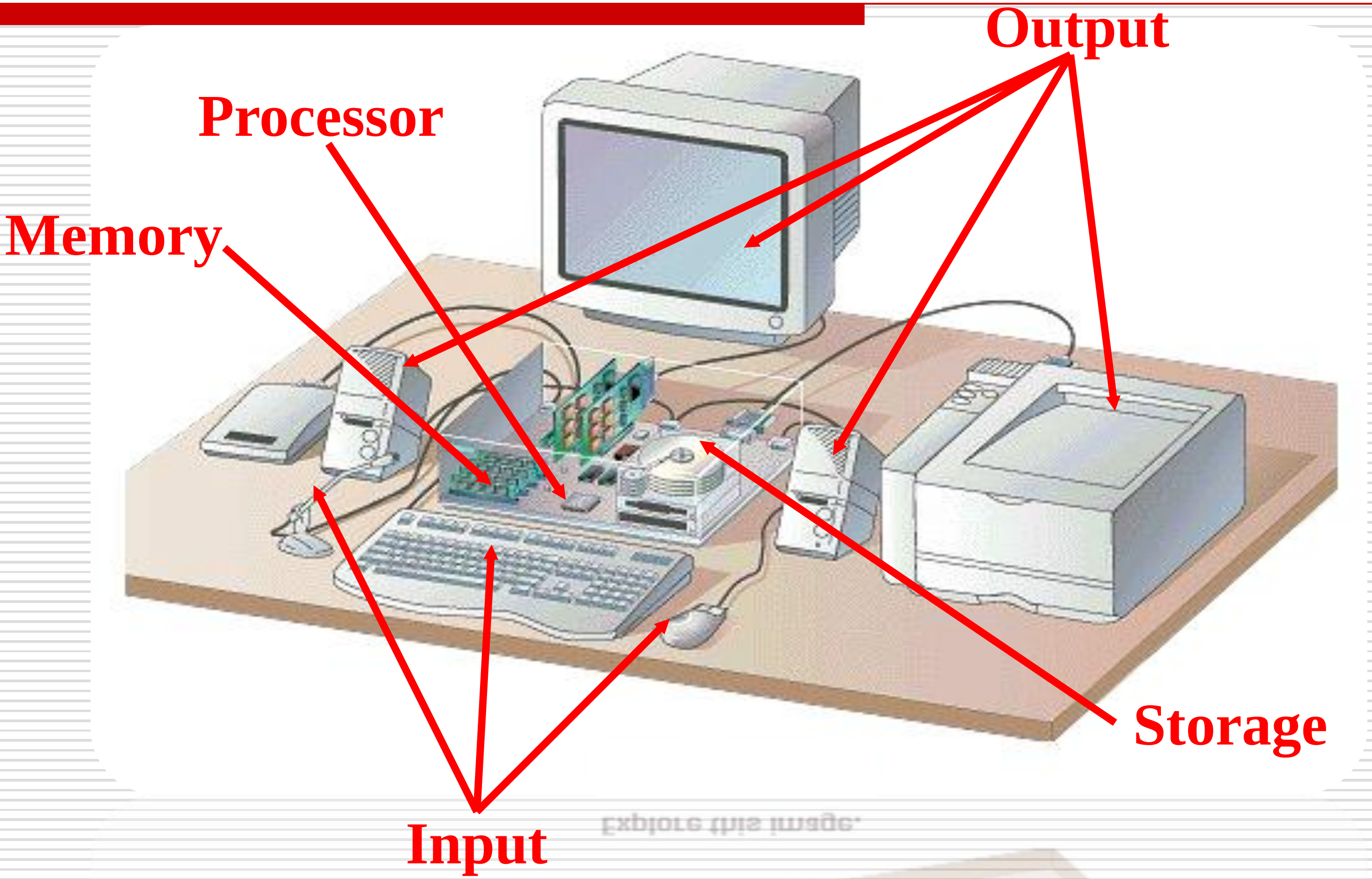
- Processor /CPU (Central processing Unit)/ Microprocessor
- Motherboard / Main Board / System Board
- RAM (Random Access Memory) / Temporary Memory
- H.D.D (Hard Disk Drive) / Permanent Memory
- Mouse, Keyboard
- Casing with Power supply
- Monitor
- CD-ROM / CD-Writer / DVD ROM / DVD-Writer
- Sound card, Graphics Card
- Speaker / Sound Box
- Printer
- Scanner
- TV Card / Radio Card, LAN Card
- Pen Drive

Classification of Hardware

Computer hardware can be divided into five categories:

1. Input Hardware – Keyboard, Mouse
2. Processing Hardware – CPU, RAM
3. Storage Hardware – Hard Disk, CD
4. Output Hardware – Monitor, Printer
5. Communication Hardware – Cable, Modem

Some types of hardware devices



Output

Processor

Memory

Storage

Input

Input Hardware

Input Hardware

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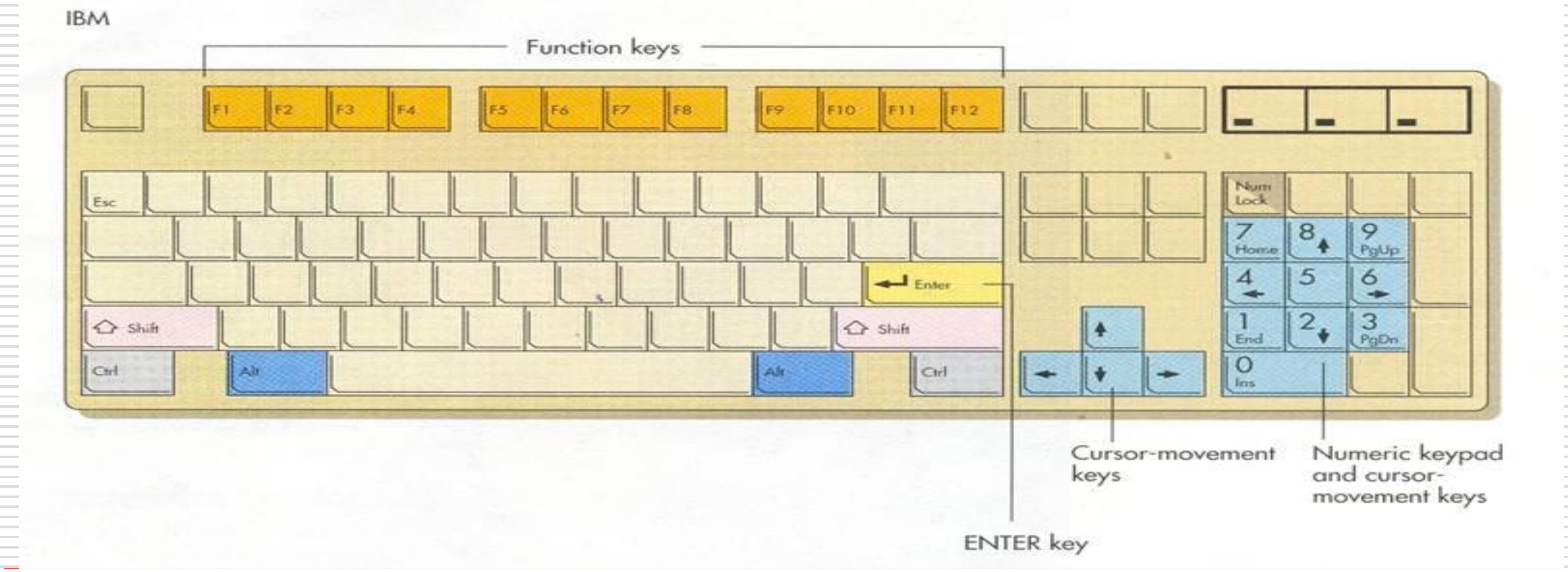
Input Hardware

- The function of Input hardware is to collect data and convert it into a form that is suitable for computer Processing.
- Input devices accept data and instructions from the user or from another computer system.
- Most Common Input Devices –
  - Keyboard
  - Mouse

Keyboard

The most common and popular input device is keyboard. It is known as the primary input device.



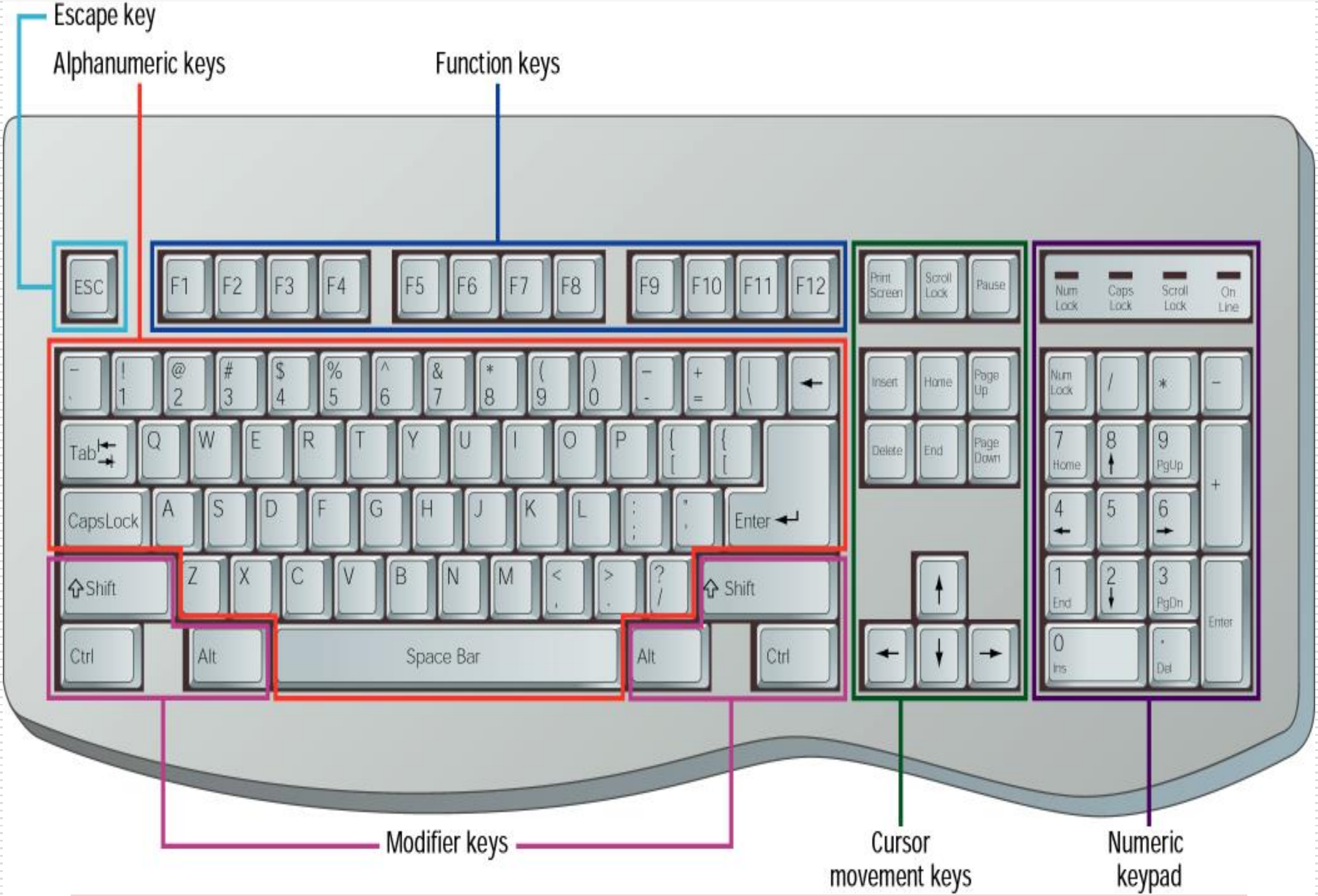
Standard Keyboard Layout

- A standard computer keyboard has about 100 keys.
- Most keyboards use the QWERTY layout, named for the first six keys in the top row of letters.

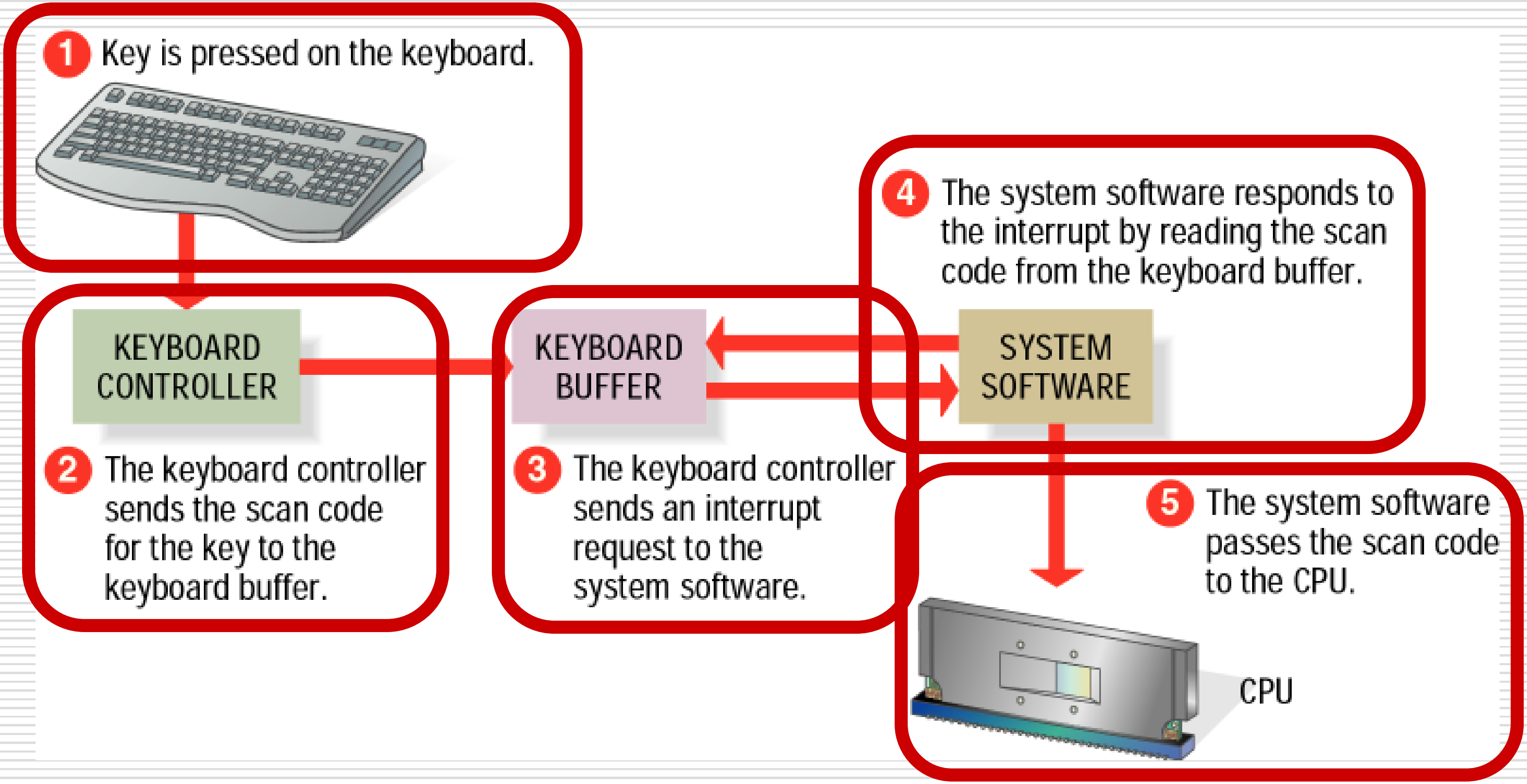
Standard Keyboard Layout (cont…)

Most keyboards have keys arranged in five groups:

1. Alphanumeric keys
2. Numeric keypad
3. Function keys
4. Modifier keys
5. Cursor-movement keys


Escape key
Alphanumeric keys
Function keys
ESC
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12
Print Screen
Scroll Lock
Pause
Num Lock
Caps Lock
Scroll Lock
On Line
~ ` ! 1 @ 2 # 3 $ 4 % 5 ^ 6 & 7 * 8 (9) 0 – - + = | \ ←
Tab Q W E R T Y U I O P { [{ [
CapsLock A S D F G H J K L : ; " ' Enter
Shift Z X C V B N M < , > . ? / Shift
Ctrl Alt Space Bar Alt Ctrl
Insert Home Page Up
Delete End Page Down
Num Lock / * –
7 Home 8 9 PgUp +
4 5 6
1 End 2 3 PgDn Enter
0 Ins . Del
Modifier keys
Cursor movement keys
Numeric keypad

How a Keyboard Works



1. Key is pressed on the keyboard.

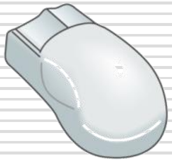
2. The keyboard controller sends the scan code for the key to the keyboard buffer.

3. The keyboard controller sends an interrupt request to the system software.

4. The system software responds to the interrupt by reading the scan code from the keyboard buffer.

5. The system software passes the scan code to the CPU.

Mouse



- Mouse is a pointing device, which is moved by hand over a flat surface to control the position of the cursor on computer display screen.
- The mouse can be used to issue commands, draw, and perform other types of input tasks.

Mouse Techniques

Using the mouse involves five techniques:

1. Pointing: Move the mouse to move the on-screen pointer.
2. Clicking: Press and release the left mouse button once.
3. Double-clicking: Press and release the left mouse button twice.
4. Dragging: Hold down the left mouse button as you move the pointer.
5. Right-clicking: Press and release the right mouse button.

Variants of the Mouse

- Track balls
  - Upside down mouse
  - Hand rests on the ball
  - User moves the ball
  - Uses little desk space

Many styles of trackball are available.

Variants of the Mouse

- Track pads
  - A track pad is a touch-sensitive pad that provides the same functionality as a mouse.
  - To use a track pad, you move smoothly your finger across its surface.

Alternative Input Devices

- Devices for the Hand
  - Pens
  - Touch-screen
  - Game controllers
- Optical Input Devices
  - Bar Code Readers
  - Scanner
  - OCR
  - OMR
- Multimedia Input Devices
  - Digital Camera
  - Microphone
  - Web Cam

Devices for the Hand

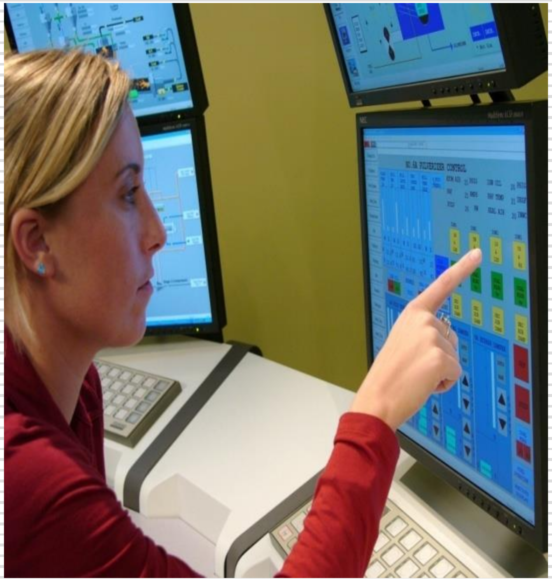
- Pens
  - With a pen-based system, you use an electronic pen to write on the screen and choose commands.
  - Pens are common input devices for handheld computers, like “personal digital assistants (PDAs).”
  - Pens are useful for making notes or selecting commands.

The user can point, draw and write on the computer’s screen with a pen.

Devices for the hand (cont…)

Touch-screen

- Touch-screen systems accept input directly through the monitor.
- Touch screens use sensors to detect the touch of a finger.
- Touch-screen systems are useful for selecting options from menus.



Devices for the hand (cont…)

- Game controllers
  - Enhances gaming experience
  - Provide custom input to the game
  - Modern controllers offer feedback
    - Joystick
    - Game pad

Optical Input Devices

- Bar Code Reader
  - A device that can read bar codes, translate them into numbers and input the numbers into a computer system.
  - The most common type of bar code reader is the flatbed model, commonly found in the supermarket and departmental store.

Optical Input Devices (cont…)

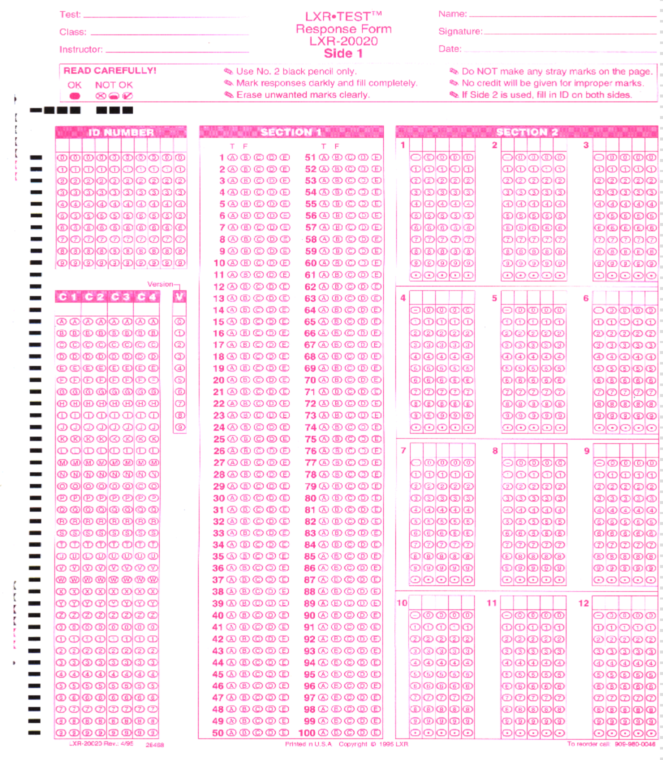
- Scanners
  - Converts printed media into electronic media.

Optical Input Devices (cont…)

- **Optical Character Recognition (OCR)**
  - Converts scanned text into editable text
  - Each letter is scanned
  - Letters are compared to known letters
  - Best match is entered into document
  - Rarely 100% accurate

Optical Input Devices (cont…)

- Optical Mark Recognition (OMR)



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Multimedia Input Devices

- Digital cameras
  - Captures images electronically
  - No film is needed
  - Image is stored as a JPG file
  - Memory cards store the images
  - Used in a variety of professions

Multimedia Input Devices (cont…)

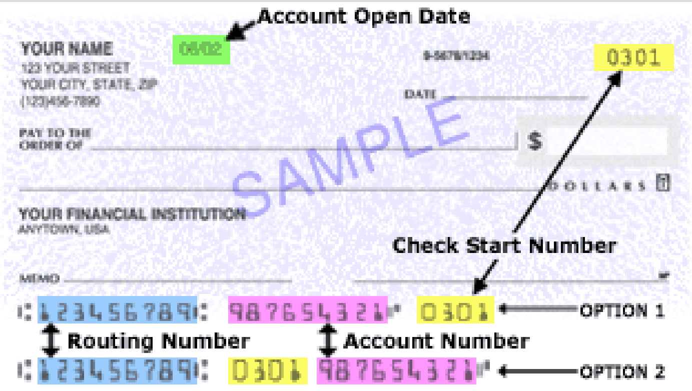
- Microphones
  - Used to record speech
  - Speech recognition
    - “Understands” human speech
    - Allows dictation or control of computer

Multimedia Input Devices (cont…)

- Web Cam
  - A camera connected to a computer or server that allows anyone connected to the Internet to view still pictures or motion video of a user.

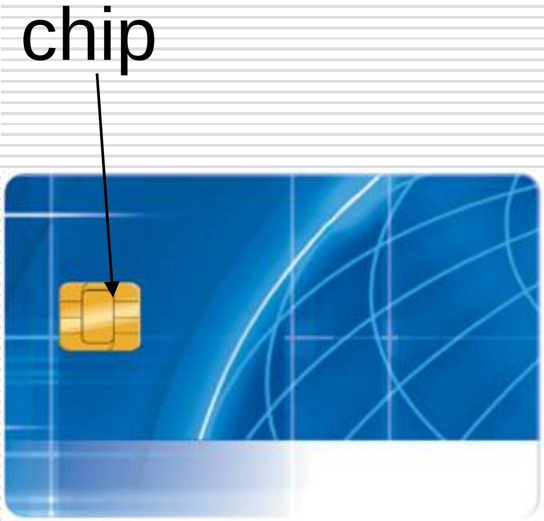
MICR (Magnetic Ink Character Recognition)

- ☐ A device that can read magnetic characters found on a document. It reads data but does not process data. It used primarily in Banks.



Smart Card Readers

Smart ID Cards
Name: Mary Thompson
Dept: Marketing
Expires: 14 May 2002
Made using environmentally-friendly materials, with an expected lifespan of 10 years



Credit Card Readers

Any Question

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Thanks to All